Chapter 1: DRS Communication with Authorized Users

In recent years, the Division of Radiation Safety has taken great steps to improve communication with our 1000 NIH Authorized Users. Some of those methods are outlined here:

DRS Website: www.nih.gov/od/ors/ds/rsb/index.html
Our website has been updated to include pertinent information previously outlined in the Radiation Safety Guide. The new website is a condensed version of the Guide and provides a quick reference to information that you may access anytime. Many of the forms required of an Authorized User are now available on our website.

AU Audits with Area Health Physicist
Each month, Area Health Physicists meet individually with selected AU's to review their radiation safety program. This personalized audit is an opportunity for you to ask questions and provide input relative to our program.

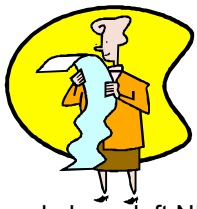
AU Emails from the Radiation Safety Officer (RSO)
On occasion, the RSO will email all the AU's to update them on major issues such as announcing an upcoming NRC inspection and changes to procedures and policies which directly impact lab operations.

AU Status Reports: "Monthly Memo"
Every month, each AU receives the "Monthly Memo" summarizing all activity taking place under their Authorization and updates to major changes in the Radiation Safety program. The memo includes the following for your review:

- List of individuals under AU's supervision
- List of labs under AU's supervision
- Inventory of radioactive material under AU's control
- Radiation safety training status

Each AU should maintain a copy of their report for future reference:

1. Identify any discrepancies you notice on this report
2. Notify DRS as soon as possible *or* indicate changes on report and fax to DRS at 496-3544
3. Notify DRS of updates to radionuclide inventory by faxing reports to 480-9708. This includes corrections, and notification that people have left NIH, or simply changed Institutes.



Communicating through the AU Portal:
Each AU has been granted access to review their personal records on file in the Division of Radiation Safety using the AU portal. Access to the portal is gained via the website: www.nih.gov/od/ors/ds/rsb/index.html (select AU Portal). You will be prompted to enter your radiation safety number and your password (social security number). Your password may be changed at your convenience. You may perform the following tasks on the portal:

- View AU news
- Manage personnel list
- Arrange for radioactive waste pick-up
- Change status of labs
- View and maintain material inventory

Soon, you will be able to electronically handle the following tasks: submit form NIH 88-1 to order your materials, manage utilization and disposal records, complete dosimeter evaluation forms, request changes to labs, access material use reports, and make email changes regarding personnel information for you and your staff. For Clinical Authorized Users, human use dosimetry tables and data will be available, as well as the ability to track and assemble the NIH 88-23a forms online.

Chapter 2: Security Policy

The NIH is dedicated to maintaining security of radioactive materials. Please ensure that your current staff, new staff, and especially summer students/visitors to your labs are aware of the NIH security policy for radioactive materials.

All radioactive material must be secured from unauthorized removal or access by:

- Locking lab when unattended
- Locking material in containers within the lab
- Being present at all times when material is in use

The Security Policy Includes…

- Open Experiments Involving Radioactivity
- LSC Vials and Standards for Counters
- All Forms of Radioactive Waste
- Source Vials (must be in locked storage when not in use. Suggestions for securing source vials include:

- Lockbox with restraining cable.
- Refrigerator/Freezer is deemed locked if:
  Keyed lock, or Hasp & keyed padlock, or Combination lock

Exception to the Policy:
The NIH Radiation Safety Committee has granted two exceptions to the security policy to allow for the continued use of liquid scintillation counters located in hallways and storage of film cassettes. For AU's in Building 49 and the Gerontology Research Building (GRC) in Baltimore, the two exceptions outlined below do not apply.

- Vials may be placed inside hallway LSC counters for analysis. Vial trays may not be stacked in hall awaiting analysis or waste pick-up.
- Film cassettes may be stored in a hall freezer provided the freezer is posted for radioactive material and kept locked.

Helpful Hints for Maintaining Security

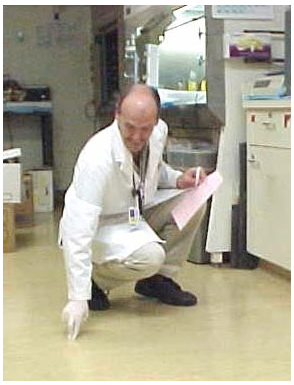
- Ask unknown individuals for their ID
- Staff who signs for radioactive shipments should immediately store radioactive material in a posted lab.
- Radioactive materials transported through unrestricted areas must always be escorted.

Radiation Safety is required to check for unlocked, or unattended radioactive materials during daily, weekend, and evening checks in each building. This includes buildings on the main campus and the satellite buildings in Rockville, Gaithersburg, and Baltimore. We encourage you to politely challenge unfamiliar individuals and request an ID. For example, NRC inspectors have frequently returned to NIH labs after hours in attempt to gain access to your labs and inspect against the NIH security policy.

Chapter 3: Contamination Surveys

Contamination control, verified by surveys, is the basis for a successful radiation safety program. The NIH has a 3-tiered survey process for research labs. First, a required daily survey of each person handling materials and their work area; second, a required monthly contamination survey; and third, a comprehensive survey periodically performed by the contractor.

Daily Surveys:
Daily surveys using survey meters or smears (for low energy betas) are the responsibility of the individual users working in your lab. A daily survey must be completed following work with radioactive materials in the lab. The survey must include yourself, lab coat, work area, and floor. As a reminder for daily use of radioactive materials, lab coats and gloves are required. Prohibited items include: no bare legs or open-toed shoes, no eating and drinking in the lab.



Monthly Surveys:
The AU is responsible for ensuring that monthly surveys are completed each month for each posted lab. A minimum of 10 smears must be taken in a lab module with at least 2 taken on the floor.

If radioactive materials were not used during the month, submit a monthly form indicating that no radioactive material was used that month. Smears are not required.

Surveys are required each month from all active labs. All surveys should be maintained in your records for 3 years. A copy of the survey, along with a printout of the smear results, is sent to DRS each month.

Monthly Laboratory Contamination Survey Form
Available on our website at http://www.nih.gov/od/ors/ds/rsb/forms/8812.pdf

Decontamination Limits:		
Location	**Alpha Emitters**	**Beta/Gamma Emitters**
Restricted Area (Posted Lab)	220 dpm/100 cm^2	2200 dpm/100 cm^2
Unrestricted Area (Public Areas)	22 dpm/100 cm^2	220 dpm/100 cm^2
Remember ALARA (As Low As Reasonably Achievable)!		

Contractor Surveys:
Radiation Safety Academy (RSA) will complete the monthly smears and report the results to your lab and Radiation Safety. The charge for this monthly survey service is approximately $35 per module per month. RSA is not responsible for cleaning contaminated locations, since this is the responsibility of the AU. Call RSA at 301-435-7953 to make arrangements. Credit Card or CAN #'s are accepted forms of payment.

Monthly Survey "Three Strike Policy":
Monthly surveys not received by DRS trigger the "Three Strikes Policy":

Strike 1: A warning memo is sent from the HP requesting missing surveys. AU written response within 10 working days is required.

Strike 2: A **w**arning memo from the RSO is sent requesting missing surveys. AU written response within 10 working days is required.

Strike 2-A: An action memo from RSO, **requiring** either inactivating the lab OR hiring the contractor (RSA) to perform the surveys is sent to the AU. Strike 2A memos are issued when the same labs are chronically non-compliant.

Strike 3: Suspension of Authorization memo from the RSO, which is in effect until AU presents a written plan to RSO to ensure future compliance.

Failure to respond within 10 working days to any strike memo may result in receiving the next level of strike enforcement.

Chapter 4: Radioactive Spills, Incidents, and Lost Radioactive Materials

DRS must be notified of any radioactive material incidents which meet the criteria below:

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- Personnel contamination or injury
- Unrestricted area is contaminated
- Large activity spilled (mCi amounts)
- Large volume spilled (>1 liter)
- Large area contaminated (>10 square feet)

This includes situations during normal working hours and those occurring after hours. There may be situations which do not require official notification. You are welcome to contact DRS and request assistance from your Area Health Physicist for any matter involving radiation safety.

Contact DRS between 8 AM and 6 PM by calling 496-5774.
After hours (on campus) dial 911 & request Radiation Safety assistance.
After hours (off-campus) dial 9-911.

Lost Radioactive Materials:

If you suspect that radioactive material may be misplaced, please notify the DRS immediately. We will do everything in our power to help you find the missing material, before we get to the process pictured below known as a “DUMPSTER DIVE”. We must find the missing material before it leaves the NIH campus!

Chapter 5: Radiation Safety Training

AU's are responsible for ensuring radiation safety training for all individuals under their supervision.

Radiation Safety Orientation (RSOR): Available online at www.nih.gov/od/ors/ds/rsb/rso/index.html

For new people who want to use material right away! RSOR is used as a temporary measure to train new RAM users and permit them to handle radioactive materials prior to taking the RSL course. RSOR is **not required** if staff don't plan to use material before taking the RSL.

The RSOR may also be used by those visitors to the NIH and minors (<18 years old) who **do not** plan to handle radioactive material. The RSOR is then used for informational purposes only.

"Radiation Safety in the Lab" (RSL)

The RSL course is required for all who work with radioactive materials. The RSL is a **mandatory** course for all new users.

Training for Individuals Returning to NIH
A returning RAM user who has been inactive for more than 2 years **must** take the next available RSL course.

Individuals returning to active user status within two years of inactivation are **not required** to retake the RSL course, but **you, the AU,** must request they be reactivated in the Radiation Safety database.

Suspension of Individual Users Failing to Attend RSL Course
Occasionally, an individual will sign up for RSL courses and fail to attend. The individual under your Authorization will not be permitted to use radioactive materials without having completed the mandatory RSL course. If the Individual User fails to attend 2 RSL courses, that individual will be suspended. You will receive a memo outlining the suspension and you are asked to ensure that materials are not handled until the course is completed. Once the mandatory course is successfully completed, the suspension is lifted, and the individual may start using radioactive materials again.

Chapter 6: Material Purchases, Deliveries, Transfers, and Records

When placing an order for radioactive materials, you must provide your radiation safety number and the radiation safety number of each individual user planning to handle that shipment. Please notify all persons who place orders under your authorization to use your AUTHORIZED USER NUMBER, sometimes referred to as CLEARANCE NUMBER, on all your orders of radioactive material.

Radioactive material must be delivered to Building 21 and **NOT** directly to your lab. In case you have not heard, due to the availability of online ordering from vendors, the RAMOS system has been discontinued.

All Radioactive Material Shipments must be delivered to the following address:

DIVISION OF RADIATION
SAFETY, NIH
21 WILSON DRIVE
BLDG. 21 ROOM 107
BETHESDA, MD. 20892-6780

Radioactive Material Deliveries to the Research Labs:

- **Deliveries are made to all *NIH campus buildings* between 7:30 AM-5:00 PM**
- **Deliveries to *Satellite Facilities* occur once a day.**

Please make sure your staff is aware of the following procedures for material receipt:

1. Radioactive materials are not delivered to offices.
2. Radioactive materials must be delivered to a posted lab.
3. Secure your radioactive material packages immediately!
4. Remove all dry ice, and ensure that the package is empty and free of contamination before disposal.

Remember to remove or deface all “Caution Radioactive Material” labels.

Radioactive Material Transfers:

On-campus transfers between AU’s

- NIH Form 88-1 “Request for Purchase and Use of Radioactive Materials” or
- Written request for transfer or
- E-mail Item # of material to be transferred

Off-campus transfers (Shipping Offsite)

- Call the Radioactive Material Control Branch (RCMB) when you know you will be shipping radioactive materials (301-496-3277).
- PLAN AHEAD WHEN SHIPPING RADIOACTIVE MATERIALS
- The Recipient’s License must be on file at DRS before a shipment can occur.
- DRS can not control the weather, so plan accordingly**.**

Utilization and Disposal Records: Tracking Your Radioactive Material Usage in the Lab

We are held accountable for ALL radioactive material shipped to the NIH. Each source vial is delivered to your lab along with an attached “Radioactive Material Utilization and Disposal Record” (U/D). You are responsible for ensuring that the sheet is completed by your users each time they aliquot from the source vial. When the vial is empty or no longer useful, you are responsible for faxing the (U/D) form back to DRS (480-9708) to remove the vial from your active inventory.

If someone who is not listed already on the form as an approved user needs to use the material, add their name to the approved list of users and sign your name next to theirs. The records will be updated in Radiation Safety to reflect the new, approved user.

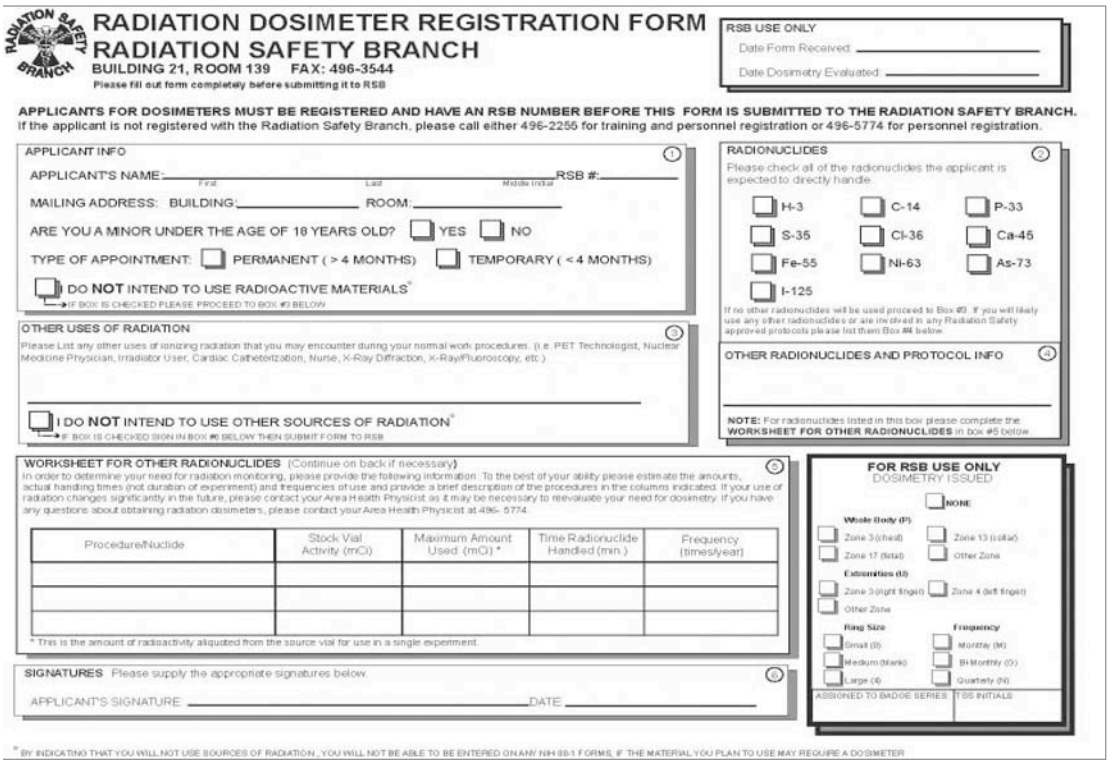
Static inventories are completed once a year in your labs. This involves reviewing, with our contractor, all of the U/D records since the last inventory to ensure that the material is clearly accounted for. To expedite this review process, we suggest you promptly

Chapter 7: Dosimetry Program

Dosimetry has changed in recent years. The old “film badge” has been replaced by an Optically Stimulated Luminescent (OSL) Dosimeter, but the TLD ring has remained the same.

Dosimeters NOT needed for: H-3, C-14, P-33, S-35, Ca-45.

Every new employee must complete a Dosimeter Registration Form so that their “potential” radiation exposure can be evaluated prior to handling radioactive material. If your research changes and your staff start using larger quantities of radioactive material or other radionuclides, please download the dosimeter form from our website (www.nih.gov/od/ors/ds/rsb/forms/dosimetry.pdf) and submit a revised form to DRS.



RADIATION DOSIMETER REGISTRATION FORM
RADIATION SAFETY BRANCH
BUILDING 21, ROOM 139 FAX: 496-3544
Please fill out form completely before submitting it to RSB

RSB USE ONLY
Date Form Received: _____
Date Dosimetry Evaluated: _____

APPLICANTS FOR DOSIMETERS MUST BE REGISTERED AND HAVE AN RSB NUMBER BEFORE THIS FORM IS SUBMITTED TO THE RADIATION SAFETY BRANCH.
If the applicant is not registered with the Radiation Safety Branch, please call either 496-2255 for training and personnel registration or 496-5774 for personnel registration.

1 APPLICANT INFO
APPLICANT'S NAME: _____ (First / Last / Middle Initial) RSB #: _____
MAILING ADDRESS: BUILDING: _____ ROOM: _____
ARE YOU A MINOR UNDER THE AGE OF 18 YEARS OLD? ☐ YES ☐ NO
TYPE OF APPOINTMENT: ☐ PERMANENT (> 4 MONTHS) ☐ TEMPORARY (< 4 MONTHS)
☐ DO **NOT** INTEND TO USE RADIOACTIVE MATERIALS*
IF BOX IS CHECKED PLEASE PROCEED TO BOX #3 BELOW

2 RADIONUCLIDES
Please check all of the radionuclides the applicant is expected to directly handle
☐ H-3 ☐ C-14 ☐ P-33
☐ S-35 ☐ Cl-36 ☐ Ca-45
☐ Fe-55 ☐ Ni-63 ☐ As-73
☐ I-125
If no other radionuclides will be used proceed to Box #3. If you will likely use any other radionuclides or are involved in any Radiation Safety approved protocols please list them Box #4 below.

3 OTHER USES OF RADIATION
Please List any other uses of ionizing radiation that you may encounter during your normal work procedures. (i.e. PET Technologist, Nuclear Medicine Physician, Irradiator User, Cardiac Catheterization, Nurse, X-Ray Diffraction, X-Ray/Fluoroscopy, etc.)
_____
☐ I DO **NOT** INTEND TO USE OTHER SOURCES OF RADIATION*
IF BOX IS CHECKED SIGN IN BOX #6 BELOW THEN SUBMIT FORM TO RSB

4 OTHER RADIONUCLIDES AND PROTOCOL INFO
_____
NOTE: For radionuclides listed in this box please complete the **WORKSHEET FOR OTHER RADIONUCLIDES** in box #5 below.

5 WORKSHEET FOR OTHER RADIONUCLIDES (Continue on back if necessary)
In order to determine your need for radiation monitoring, please provide the following information. To the best of your ability please estimate the amounts, actual handling times (not duration of experiment) and frequencies of use and provide a brief description of the procedures in the columns indicated. If your use of radiation changes significantly in the future, please contact your Area Health Physicist as it may be necessary to reevaluate your need for dosimetry. If you have any questions about obtaining radiation dosimeters, please contact your Area Health Physicist at 496- 5774.

Procedure/Nuclide	Stock Vial Activity (mCi)	Maximum Amount Used (mCi) *	Time Radionuclide Handled (min.)	Frequency (times/year)

* This is the amount of radioactivity aliquoted from the source vial for use in a single experiment.

FOR RSB USE ONLY
DOSIMETRY ISSUED
☐ NONE
Whole Body (P)
☐ Zone 3 (chest) ☐ Zone 13 (collar)
☐ Zone 17 (fetal) ☐ Other Zone
Extremities (U)
☐ Zone 3 (right finger) ☐ Zone 4 (left finger)
☐ Other Zone
Ring Size
☐ Small (S) ☐ Medium (blank) ☐ Large (4)
Frequency
☐ Monthly (M) ☐ Bi-Monthly (O) ☐ Quarterly (N)
ASSIGNED TO BADGE SERIES | TSS INITIALS

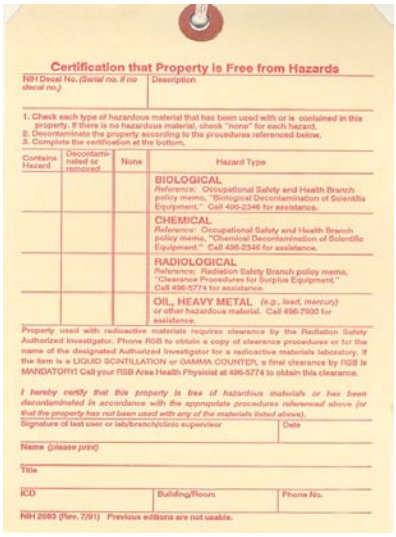
6 SIGNATURES Please supply the appropriate signatures below.
APPLICANT'S SIGNATURE _____ DATE _____

* BY INDICATING THAT YOU WILL NOT USE SOURCES OF RADIATION , YOU WILL NOT BE ABLE TO BE ENTERED ON ANY NIH 88-1 FORMS, IF THE MATERIAL YOU PLAN TO USE MAY REQUIRE A DOSIMETER

Your new staff may ask you to assist them in completing this form since they may not know what radioactive materials you plan to have them handle. Boxes #1-4 are self-explanatory, but Box #5 instructions provide the most challenges:

Box #5:
Procedure: What process will your Individual User (IU) be using and what nuclide(s) will be involved?
Stock Vial Activity: How much activity is in the original source vial?
Maximum Activity Used: How much activity will the IU be aliquoting from the original source vial to be used in the procedure?
Time Radionuclide Handled: Actual physical handling time, NOT how long procedure lasts.
Frequency of Procedure: How many times a year will the IU perform this procedure?

Chapter 8: Equipment/Lab Clearances and Moving Labs



Certification that Property is Free from Hazards

NIH Decal No. (Serial no. if no decal no.) | Description

1. Check each type of hazardous material that has been used with or is contained in this property. If there is no hazardous material, check "none" for each hazard.
2. Decontaminate the property according to the procedures referenced below.
3. Complete the certification at the bottom.

Contains Hazard	Decontaminated or removed	None	Hazard Type
			BIOLOGICAL Reference: Occupational Safety and Health Branch policy memo, "Biological Decontamination of Scientific Equipment." Call 496-2346 for assistance.
			CHEMICAL Reference: Occupational Safety and Health Branch policy memo, "Chemical Decontamination of Scientific Equipment." Call 496-2346 for assistance.
			RADIOLOGICAL Reference: Radiation Safety Branch policy memo, "Clearance Procedures for Surplus Equipment." Call 496-5774 for assistance.
			OIL, HEAVY METAL (e.g., lead, mercury) or other hazardous material. Call 496-7930 for assistance.

Property used with radioactive materials requires clearance by the Radiation Safety Authorized Investigator. Phone RSB to obtain a copy of clearance procedures or for the name of the designated Authorized Investigator for a radioactive materials laboratory. If the item is a LIQUID SCINTILLATION or GAMMA COUNTER, a final clearance by RSB is MANDATORY! Call your RSB Area Health Physicist at 496-5774 to obtain this clearance.

I hereby certify that this property is free of hazardous materials or has been decontaminated in accordance with the appropriate procedures referenced above (or that the property has not been used with any of the materials listed above).

Signature of last user or lab/branch/clinic supervisor | Date

Name (please print)

Title

ICD | Building/Room | Phone No.

NIH 2063 (Rev. 7/91) Previous editions are not usable.

Equipment: The form on the left is a clearance tag for equipment and must be attached to any surplus item. A copy of your smear results for that item must remain in your records for 3 years. The decontamination limit for Beta/Gamma emitters is 1000 dpm/100 cm^2. If clearing items that were contaminated with alpha emitters or iodines, contact your Area HP for release levels.

Labs: Clearances are required to inactivate a lab for moving or for lab renovations. Before requesting a lab clearance, ensure that following has been completed:

1. Perform a smear survey of lab taking 10 smears per module. Make sure you meet the limits for unrestricted areas as outlined earlier in this presentation.

2. Remove all items labeled as radioactive from lab (including waste containers). Either survey the item and remove the label OR move the item to another posted lab.

3. Call your Area Health Physicist to arrange a clearance.

Procedures to Move a Lab:

Off-campus moves, all radioactive materials MUST be moved by DRS. As part of the process, DRS will inventory your source vials with your assistance. Lab personnel may only move equipment that has been cleared by Radiation Safety. Any contaminated equipment must be packaged and moved by DRS.

_____ WAS CLEARED BY THE
AREA OR ITEM
RADIATION SAFETY BRANCH*
ON_____ BY _____
DATE SIGNATURE
NO RADIOACTIVE MATERIAL MAY BE USED IN THIS AREA OR ITEM UNTIL THIS STICKER HAS BEEN REMOVED.
REFER QUESTIONS TO 496-5774
*THIS CERTIFICATION APPLIES ONLY TO RADIOACTIVE MATERIALS. CLEARANCE FOR OTHER COMPONENTS, e.g., BIOHAZARDOUS, OR CHEMICALLY HAZARDOUS MATERIALS, MUST BE OBTAINED SEPARATELY.
SP-NIH006

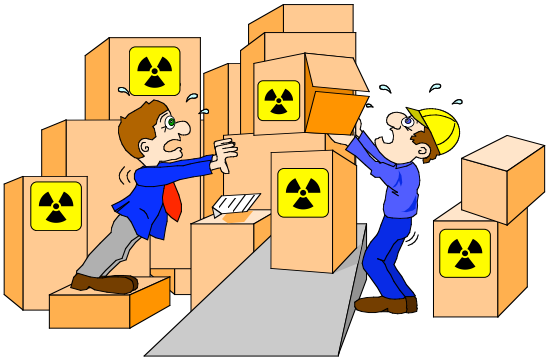
Major moves on campus, (between floors, between buildings), source vials MUST be moved by DRS. Prior to moving; DRS will complete an inventory of your radioactive material. Plan in advance for this inventory before your move. Small samples in tubes may also be moved by DRS, but will not be inventoried. Lab personnel may move equipment once it has undergone proper clearance procedures.

Minor moves, (down the hall on the same floor) lab staff may move radioactive materials between labs provided the material is doubly-contained and attended at all times until secured in the new posted lab. Contaminated equipment may be moved between labs provided the material is doubly-contained and immediately stored in a posted lab in the new location.

Final DRS clearance of old lab is required for all moves. Contact DRS at 496-3277 to make arrangements for shipping.

AU's Leaving NIH

If you are leaving the NIH, please notify DRS so all your material can be disposed or transferred to another AU. In addition, your labs and Individual Users must be transferred to another AU prior to your departure.



Chapter 9: Procedures for Minors Using Radioactive Materials and the Fetal Protection Program

Minors:

Minors under the age of 16 may not use radioactive materials at the NIH.

Minors between ages 16-17 may use radioactive material with special approval from the Radiation Safety Officer provided they:

1. Complete Lab Safety and Radiation Safety Courses.

2. Provide a written request from the AU explaining the conditions of use and a commitment for direct supervision from a trained NIH staff member when using radioactive material.

3. Obtain parental consent.

Fetal Protection Program
As part of the Radiation Safety Program, a Fetal Protection Program is available.

- Voluntary program initiated by the pregnant woman. If she decides to declare her pregnancy, it i the responsibility of the pregnant worker to initiate the process by declaring her pregnancy in writing to the Division of Radiation Safety.

- Once she declares her pregnancy, a special limit of 500 mrem is applied to the fetus throughout the pregnancy.

- Pregnancy declarations are confidential; but, the Authorized User must be notified.

To formally declare one's pregnancy, the Declaration of Pregnancy form must be completed and mailed to the Division of Radiation Safety, Building 21, Room 115, or faxed to 496-3544. This form is located on our website at: http://www.nih.gov/od/ors/ds/forms/pregnancy.pdf .

Most often, consultations with occupationally exposed pregnant workers do not warrant significant changes to daily activities involving radiation and radioactive materials. However, we encourage the individual to meet with their Area Health Physicist and Authorized User to:

- Review information on biological effects from exposure to ionizing radiation
- Assess potential radiation exposure and risk
- Discuss precautions and/or restrictions
- If necessary, establish an exposure monitoring program

Note that the Declaration of Pregnancy can be voluntarily revoked by the individual at any time, should she choose to do so.

Chapter 10: Radioactive Waste Procedures

Waste Segregation:
Wastes should first be segregated based on whether or not they are pure radioactive or mixed waste.

Radioactive Waste is waste that contains or is contaminated with radioactive material. Radioactive Waste must be segregated according to half-life:

< 120 day half-life
> 120 day half-life

Mixed Waste is waste that contains both a chemical component regulated by the EPA, as a hazardous waste, biological and/or radioactive material. Mixed Waste must be segregated in the following manner:

- Very short (< 30 days)
- Intermediate (30-120 days)
- Long (> 120 days)

Identify and Label Waste

- List on the Radioactive Waste Pickup Receipt an ACCURATE indication of the nuclide(s) and activity present at time of pickup

- Ensure that all waste containers have:
- Caution Radioactive Material labels
- Radioactive Waste Pickup Receipt tags

Radioactive and mixed waste must be secured at all times. NEVER place radioactive waste in corridors – even while awaiting pickup.

Please keep in mind the need to minimize the generation of radioactive and chemical waste. This is mandated by Resource Conservation Recovery Act (RCRA), Pollution Prevention Act, and NIH policy. In addition, minimization saves money, conserves resources, and reduces liability.

For more detailed information on proper waste disposal procedures, refer to www.nih.gov/od/ors/ds/wasteguide/index.html .